What is claimed is:

1. An optical device for detecting the position of a beam and the position of a sample on a diffractometer, comprising:

a scintillator optically set up at a sample location; and

a video microscope aimed at the sample location.

2. The optical device as claimed in claim 1, wherein the scintillator is fixed to a motorized displacement table.

3. The optical device as claimed in claim 1, wherein the scintillator is coupled to a photodiode by means of an optical waveguide.

4. The optical device as claimed in claim 1 , wherein the video microscope is aimed at the sample location coaxially with respect to the beam.

5. The optical device as claimed in claim 4, wherein the video microscope is arranged in the forward direction in extension of the beam.

6. The optical device as claimed in claim 4, wherein the video microscope is aimed, with an orientation of 90 degrees with respect to the beam, at a mirror which is oriented at 45 degrees with respect to the beam and is penetrated by the latter through a hole provided in the mirror.

7. The optical device as claimed in claim 4, wherein an objective of the video microscope is provided with a coaxial hole through which the beam runs before reaching the sample.

8. A device for the precision rotation of samples, comprising:

a motor driven rotating shaft having an axis of rotation and being provided with a sample holder configured to hold a sample; and

the optical device according to claim 1.

9. The device for the precision rotation of samples as claimed in claim 8, wherein the rotating shaft and the components connected thereto are fixed to a diffractometer table or a motorized tilting device.

10. The optical device as claimed in claim 8, wherein the image registered by the video microscope is fed to a computer for automatic beam localization and sample adjustment.

11. The device for the precision rotation of samples as claimed in claim 8, further comprising a motorized displacement table for the introduction of a beam stop and/or beam tube into the beam.

12. The device for the precision rotation of samples as claimed in claim 8, further comprising means for attaching a sample surround.

13. The device for the precision rotation of samples as claimed in claim 8, wherein the rotating shaft is mounted using ball bearings.

14. The device for the precision rotation of samples as claimed in claim 8, wherein the rotating shaft is mounted using air bearings.

15. In a device for the precision rotation of samples comprising a motor driven rotating shaft having an axis of rotation and being provided with a sample holder configured to hold a sample, a method for detecting the position of a beam and the position of the sample, comprising:

positioning a scintillator at a sample location;

aiming a video microscope at the sample location;

causing a beam to strike the scintillator;

moving the scintillator from the sample location to another location; and

positioning the sample at the sample location.

16. The method of claim 15, further comprising the step of using a a motorized displacement table to move the scintillator.

17. The method of claim 15, further comprising the step of coupling the scintillator to a photodiode using an optical waveguide.

18. The method of claim 15 , wherein the step of aiming the video microscope comprises aiming the video microscope at the sample location coaxially with respect to the beam.

19. The method of claim 18, further comprising the step of arranging the video microscope in the forward direction in extension of the beam.

20. The method of claim 18, wherein the video microscope is aimed, with an orientation of 90 degrees with respect to the beam, at a mirror which is oriented at 45 degrees with respect to the beam and is penetrated by the latter through a hole provided in the mirror.